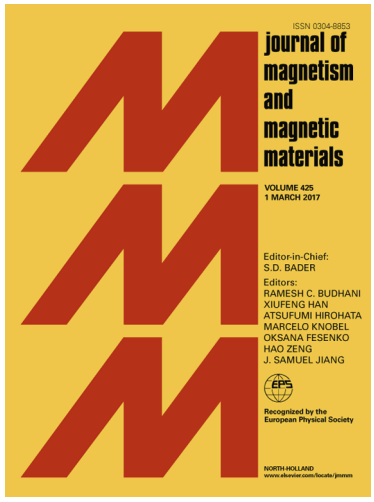

Research articles

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Soft magnetic property of $(Fe_{60}Co_{35}Ni_5)_{78}$ $Si_6B_{12}Cu_1Mo_3$ alloys by laser additive manufacturing

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Abstract: Laser additive manufacturing (LAM) is a novel method for processing compositionally graded alloys and becomes increasingly important in the context of next-generation manufacturing technology. In this work, $(Fe_{60}Co_{35}Ni_5)_{78}Si_6B_{12}Cu_1Mo_3$ soft magnetic alloys with different laser power were designed and processed by the LAM. The magnitudes of magnetic properties were analyzed, and the relationships among composition-microstructure-magnetic properties assessed. Results show that the $(Fe_{60}Co_{35}Ni_5)_{78}Si_6B_{12}Cu_1Mo_3$ alloys by LAM exhibits relative uniform microstructure and comparable magnetic property compared with those conventional processed alloys. The bcc dominated microstructures exhibit a substantially higher saturation magnetization (Ms). With the increase in power, the average grain size of the alloy increased slightly and the increasing volume fraction of the Fe-Si phase